

ABSTRACT

HEART WALL ACTUATION DEVICE FOR THE NATURAL HEART

An actuation system for assisting the operation of the natural heart comprises a framework for interfacing with a natural heart, through the wall of the heart, which includes an internal framework element configured to be positioned within the interior volume of a heart and an external framework element configured to be positioned proximate an exterior surface of the heart. The internal framework is flexibly suspended with respect to the external frame. An actuator system is coupled to the framework and configured to engage an exterior surface of the heart. The actuator system comprises an actuator band extending along a portion of a heart wall exterior surface. The actuator band is selectively movable between an actuated state and a relaxed state and is operable, when in the actuated state, to assume a predetermined shape and thereby indent a portion of the heart wall to effect a reduction in the volume of the heart. A drive apparatus is coupled to the actuator band and is operable for selectively moving the actuator band between the relaxed and actuated states to achieve the desired assistance of the natural heart.